



A.D. 1871, 14th OCTOBER. N^o 2726.

SPECIFICATION

OF

WILLIAM LEATHAM.

AMBULANCE CARRIAGES OR FIELD
HOSPITALS.

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A.D. 1871, 14th OCTOBER. N° 2726.

Ambulance Carriages or Field Hospitals.

LETTERS PATENT to William Leatham, of Leeds, in the County of York, for the Invention of “**IMPROVEMENTS IN AMBULANCE CARRIAGES AND OTHER VEHICLES FOR THE REMOVAL OF THE SICK OR WOUNDED, BEING ALSO APPLICABLE FOR FIELD HOSPITALS AND OTHER PURPOSES.**”

Sealed the 3rd April 1872, and dated the 14th October 1871.

PROVISIONAL SPECIFICATION left by the said William Leatham at the Office of the Commissioners of Patents, with his Petition, on the 14th October 1871.

I, WILLIAM LEATHAM, of Leeds, in the County of York, do hereby
5 declare the nature of the said Invention for “**IMPROVEMENTS IN AMBULANCE CARRIAGES AND OTHER VEHICLES FOR THE REMOVAL OF THE SICK OR WOUNDED, BEING ALSO APPLICABLE FOR FIELD HOSPITALS AND OTHER PURPOSES,**” to be as follows :—

My Invention consists in certain improvements in carriages or
10 vehicles for conveying the sick or wounded in time of war, or on

Leatham's Improvements in Ambulance Carriages or Field Hospitals.

other occasions where steadiness of conveyance is required, as in the case of fever patients or others. It is also applicable as a field hospital, all as hereafter described.

The body of the carriage is constructed in the form of a reservoir or tank. In it is placed another vessel, an annular space being left between 5 the tank and the inner vessel. A covering is placed over this space and secured to both vessels, forming an air-tight compartment. The covering is capable of expansion, and may be composed of caoutchouc or other elastic sheeting, for the purpose of allowing the required motion to the inner vessel. The reservoir or tank is partially filled with water, 10 and the remaining portion between the inner and outer vessel filled as may be required with compressed air. For this purpose I employ a force pump, press, or other equivalent, which I attach to the side of the tank. Motion may be given thereto by hand or by being connected or coupled by any suitable known means to a crank or eccentric attached 15 to the wheels or axles.

When the latter arrangement is employed the air is forced in when the carriage is in motion. The inner vessel is thereby made to float, and forms the platform on which the supports or framework are mounted, carrying the berths or beds. The air and water, either 20 separately or in conjunction may be brought to any required pressure, forming a cushion for the inner vessel.

The reservoir or tank is mounted on four wheels having on their tires a covering of caoutchouc or other suitable elastic substance. The front wheels are provided with a compensating motion of ordinary 25 construction and a rocking swivel. By this arrangement sharp curves and irregular surfaces may be passed along without altering the stability of the carriage.

The berths or beds are so constructed or hung that they may be placed at any angle to suit the position required for the patient, and 30 the mattresses on the beds or berths are made of an air-tight substance, so that they may be either filled with air or water at pleasure. For this purpose suitable flexible pipes are employed to convey air or water from the tank or reservoir to the mattresses.

I provide another tank or vessel which I place and fix in the inner 35 vessel for the supply of water to the patients. This tank is so sur-

Leatham's Improvements in Ambulance Carriages or Field Hospitals.

rounded with compressed air and water that the water contained therein is not affected by excesses of temperature.

I provide in each corner or other places under the floating parts of the carriage a cylinder provided with a piston or pistons, or their
5 equivalents, communicating with the interior of the tank or reservoir. These form compensating supports for the floating platform when the surface of the water subsides in any direction, which may happen on steep inclines of roads. The carriage, by the assistance of compressed air in the bottom tank or reservoir, is made perfectly buoyant in water,
10 so that it may be conveyed over deep sheets or streams of water without in any way disturbing the patients.

By the herein described arrangement of carriage all jostling or jolting (so prejudicial to patients) caused by irregularity of roads or in other ways is avoided. The whole of the patients may be floated on the
15 water or air in the tank, which water and air form a cushion.

The herein described carriage may be constructed principally of wood, but I prefer when and where practicable thin galvanized sheet steel, by the use of which great advantages are obtained with regard to the sanitary conditions of the carriage or hospital.

20 I attach to the floating framework one or more cranes or elevators whereby the patients may be raised and delivered into any berth or bed without the inconvenience of handling or otherwise shaking them.

SPECIFICATION in pursuance of the conditions of the Letters Patent,
filed by the said William Leatham in the Great Seal Patent Office
25 on the 12th April 1872.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WILLIAM LEATHAM, of Leeds, in the County of York, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Fourteenth day of October, in the
30 year of our Lord One thousand eight hundred and seventy-one, in the thirty-fifth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said William Leatham, Her special

Leatham's Improvements in Ambulance Carriages or Field Hospitals.

licence that I, the said William Leatham, my executors, administrators, and assigns, or such others as I, the said William Leatham, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, 5 use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for “IMPROVEMENTS IN AMBULANCE CARRIAGES AND OTHER VEHICLES FOR THE REMOVAL OF THE SICK OR WOUNDED, BEING ALSO APPLICABLE FOR FIELD HOSPITALS AND OTHER PURPOSES,” upon the condition (amongst others) 10 that I, the said William Leatham, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent 15 Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said William Leatham, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and 20 by the following statement, reference being had to the accompanying Drawings, and to the letters of reference marked thereon, that is to say:—

My Invention consists in certain improvements in carriages or vehicles for conveying the sick or wounded in time of war, or on 25 other occasions where steadiness of conveyance is required, as in the case of fever patients or others. It is also applicable as a field hospital, all as hereafter described.

The manner in which my Invention is or may be carried into practice will be readily understood by reference to the accompanying Sheet of 30 Drawings.

Fig. 1 is a side elevation; Fig. 2 is a front elevation; Fig. 3 is a plan; and Fig. 4 is a half sectional plan shewing arrangement of car opened out when required for a field hospital; Fig. 5 shews the car closed up as an ambulance; Figs. 6 and 7 shew arrangements of piston; and Fig. 8 35 are views of the drawing shaft.

Leatham's Improvements in Ambulance Carriages or Field Hospitals.

The body of the carriage is constructed in the form of a reservoir or tank 1, as shewn; in it is placed another vessel, 2; an annular space 3 is left between the tank 1 and the inner vessel 2; a covering 4 is placed over this annular space, and is secured to both vessels, 1 and 2, forming 5 an air-tight compartment 3. The covering 4 is capable of expansion and contraction, and may be composed of caoutchouc or other sheeting for the purpose of allowing the required motion to the inner vessel 2. The inner vessel 2 is covered at the top with metal flooring or other suitable material, as shewn at 5, and forms the platform on which the 10 supports or framework 6 are mounted, carrying the berths or beds. I provide the additional framework 7, which is hinged on to the framework 6. This may be closed, as shewn in Fig. 5, when required as an ambulance carriage, or opened out, as shewn at 7, Fig. 2, when required as a field hospital.

15 The whole of the roof and sides are covered in when required by canvass or other sheeting, as shewn by dotted lines at 8 in Figs. 2 and 5, which can be drawn away on to the rollers 9 by means of the winch handle 10, leaving the whole of the interior open to the atmosphere. 11, 12, and 13 are ventilators of ordinary construction; these may be 20 opened or closed at pleasure. The windows 14 and double doors 15 are provided at each end. The upper pallets 16 are slung upon bands hooked on to the framework at 17 and supported on the inner side at 18, as shewn. The upper pallets 19 within the carriage are slung upon bands 20 hooked upon the cross bar 21, which is carried by the frame- 25 work. The lower pallets 22 rest on the platform. By this arrangement the berths may be placed at any angle to suit the position required by the patient.

The mattresses I make in form and of an air-tight substance similar to air or water mattresses of ordinary construction; these I fill with 30 water or air when required, as hereafter described.

The reservoir or tank 1 is mounted on four wheels, 23 and 24, having by preference a covering of caoutchouc, 25, or other suitable elastic substance on their tires, though not necessarily so. The axles of the front wheels are provided with a compensating motion 26, of ordinary construc- 35 tion, for passing round sharp curves, and a rocking swivel 27, whereby irregular surfaces may be passed over without altering the stability and level of the floating part of the carriage. The reservoir or tank 1 is partially filled with water, and the remaining portion between the

Leatham's Improvements in Ambulance Carriages or Field Hospitals.

inner and outer vessel is filled as may be required with compressed air.

For the purpose of supplying the compressed air or water I employ one or more force pumps 28 or their equivalents, which I attach to the side of the tank 1; motion may be given thereto by being connected or 5 coupled to a crank or eccentric 29 attached to the wheels or axles as shewn. By this arrangement the air or water may be forced in when the carriage is in motion or stationary, the wheels 24 being made to revolve either by travelling or by hand, the air or water being forced into the interior, the inner vessel is thereby made to float. A spring 10 safety valve of ordinary construction may be employed to let off the superabundant pressure of air.

For the purpose of supplying air or water to the mattresses I provide the taps 30 and 31; to these I connect the elastic tubes 32 and 33, which at a suitable point may be joined into one tube 35. The tube 35 15 is coupled to any mattress when required at the tap 36. By this arrangement air or water may be forced into the mattresses and retained there by closing the tap 36. I provide by preference in each corner under the floating platform a cylinder 37 having a piston 38 and piston rod 39. A communication is provided between each cylinder and the 20 interior of the tank 1. These pistons form compensating supports for the floating platform 6 when the surface of the water in the interior of the tank 1 subsides in any direction, which may happen on steep inclines or other irregular surfaces of roads.

I provide another tank or vessel 40, which I place and fix in the 25 inner vessel 2, for the supply of water to the patients. This tank is so surrounded with compressed air and water so that the water contained therein is not affected by excesses of temperature. I also attach to the floating framework 7 one or more cranes or elevators 41 of ordinary construction, as shewn, whereby the patients may be raised and delivered 30 into any berth or bed without the inconvenience of handling or otherwise shaking them.

The piston consists of two plates, *a* and *b*, as shewn at Figs. 6 and 7, having between them a ring *c*. In the interior I provide the magnets *d* and *e*, which pass through the ring *c* into the split packing rings *f* 35 and *g*. The iron cylinder attracts the magnets *d* and *e* through the holes *h* in the packing rings *f* and *g*, and draws them outwards, at the

Leatham's Improvements in Ambulance Carriages or Field Hospitals.

same time the magnets *d* and *e* force the split packing rings outwards against the face of the cylinder, compensating thereby for the wear, and preserve the piston, air, water, or steam tight.

Having thus described the nature of my said Invention, and in what
5 manner the same may be performed or carried into practical effect, I would observe that I do not confine myself to the precise details herein set forth, as the same may be varied or modified without departing from my Invention; but what I claim and desire to be secured to me by Letters Patent is,—

10 Firstly. The arrangement, construction and application of tanks 1 and 2, and the parts connected therewith, whereby the upper part of the carriage may be floated in the lower tank or vessel 1, substantially as and for purposes herein set forth.

Secondly. The arrangement, construction and combination of the
15 various parts, forming a field hospital or ambulance carriage, substantially as herein set forth.

Thirdly. The arrangement, construction and application of magnetic piston shewn at Figs. 6 and 7, substantially as and for purposes herein set forth.

20 In witness whereof, I, the said William Leatham, have hereunto set my hand and seal, this Eleventh day of April, in the year of our Lord One thousand eight hundred and seventy-two.

WILLIAM LEATHAM. (L.S.)

LONDON:

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Printers to the Queen's most Excellent Majesty. 1872.

Scale $\frac{1}{2}$ of an Inch to the Foot

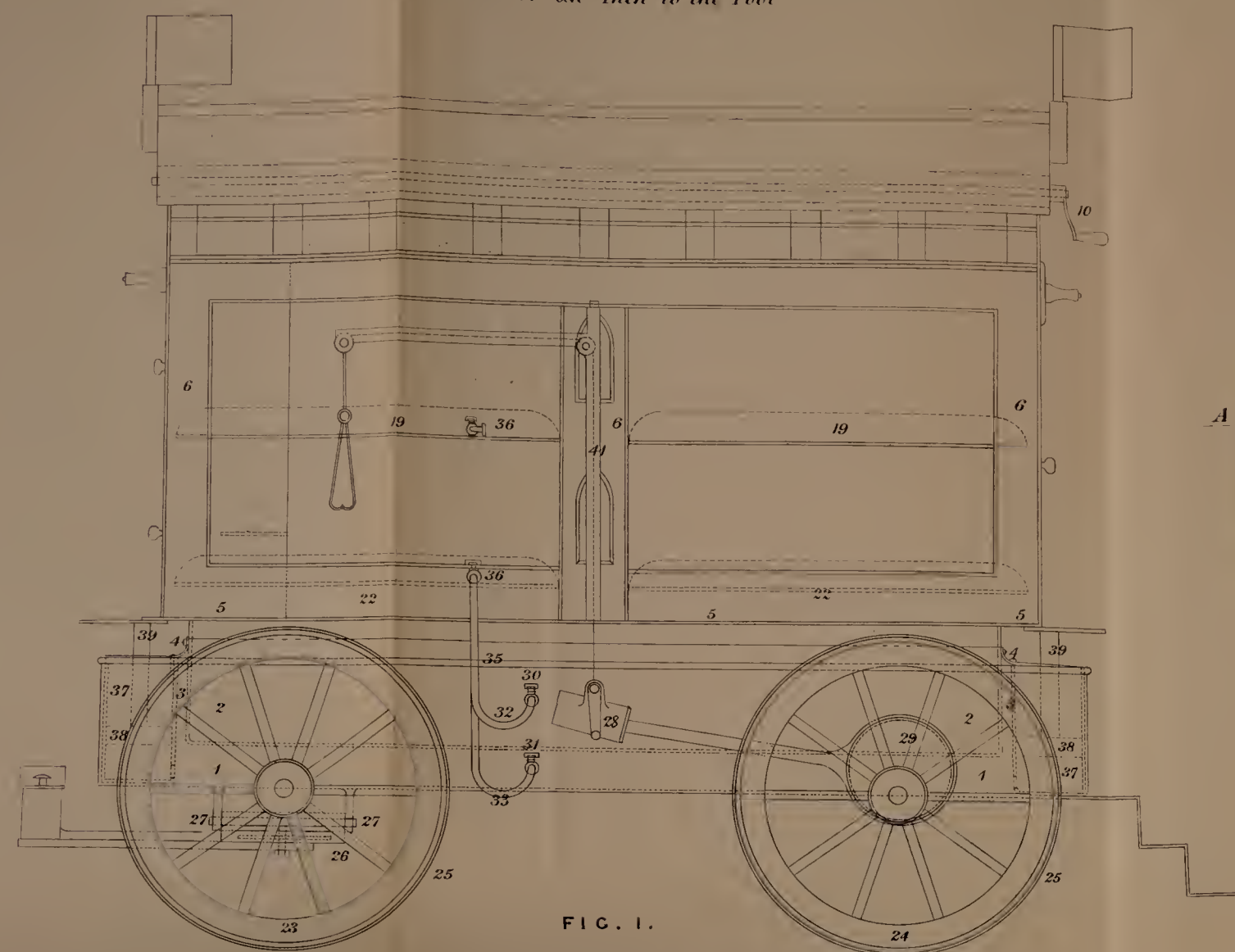


FIG. 1.

Side Elevation

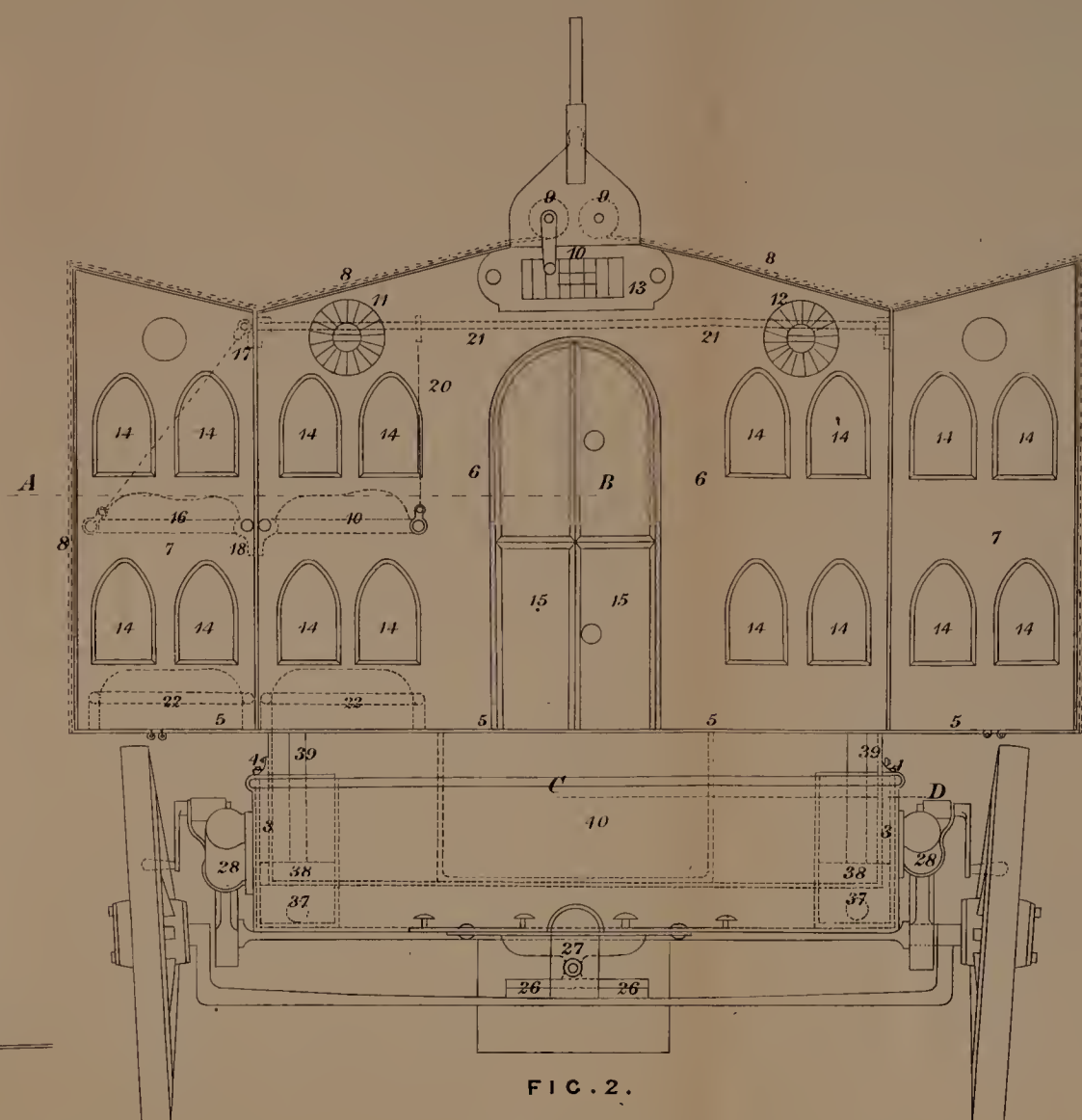


FIG. 2.

Front Elevation

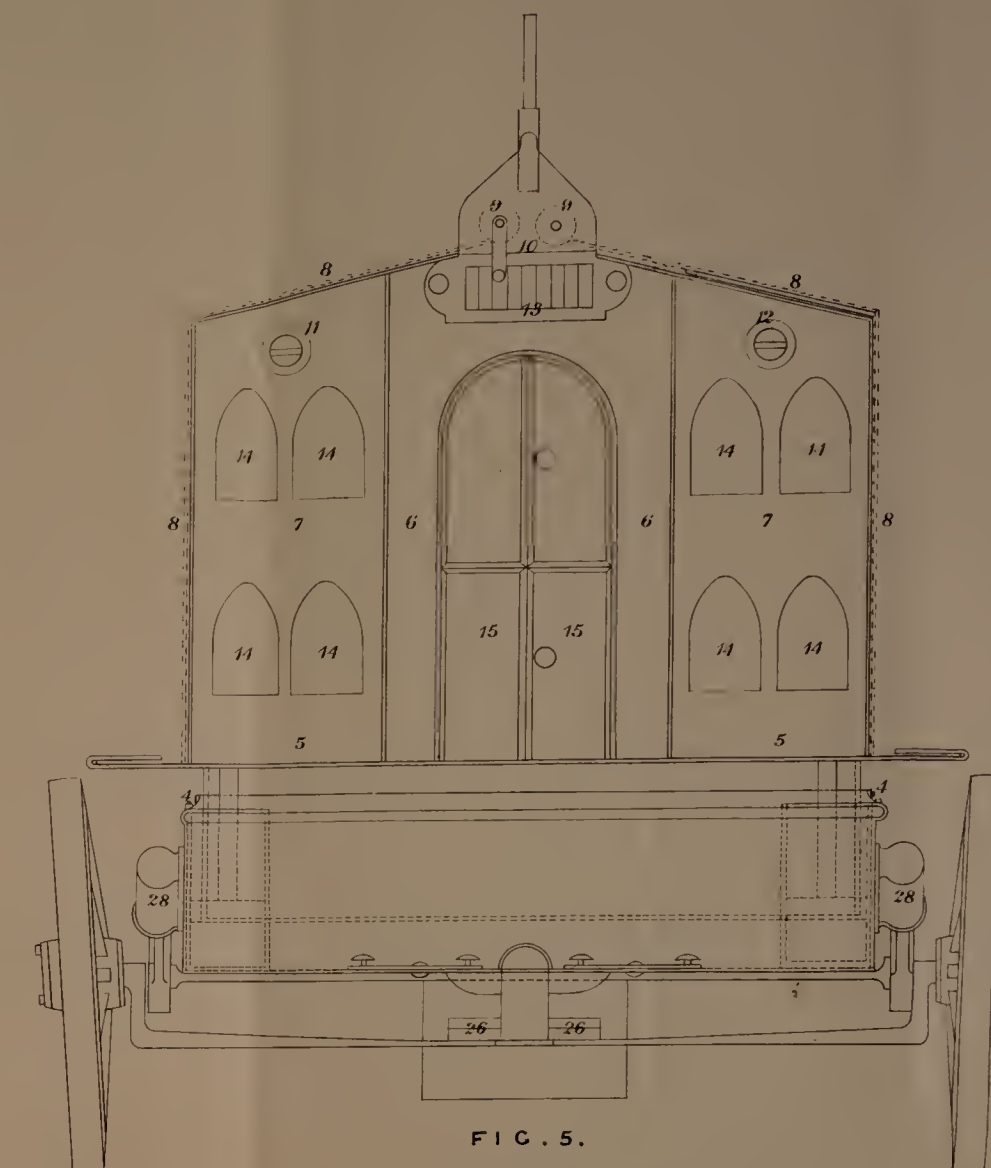


FIG. 5.

Front Elevation

Half sectional plan on line A. B.

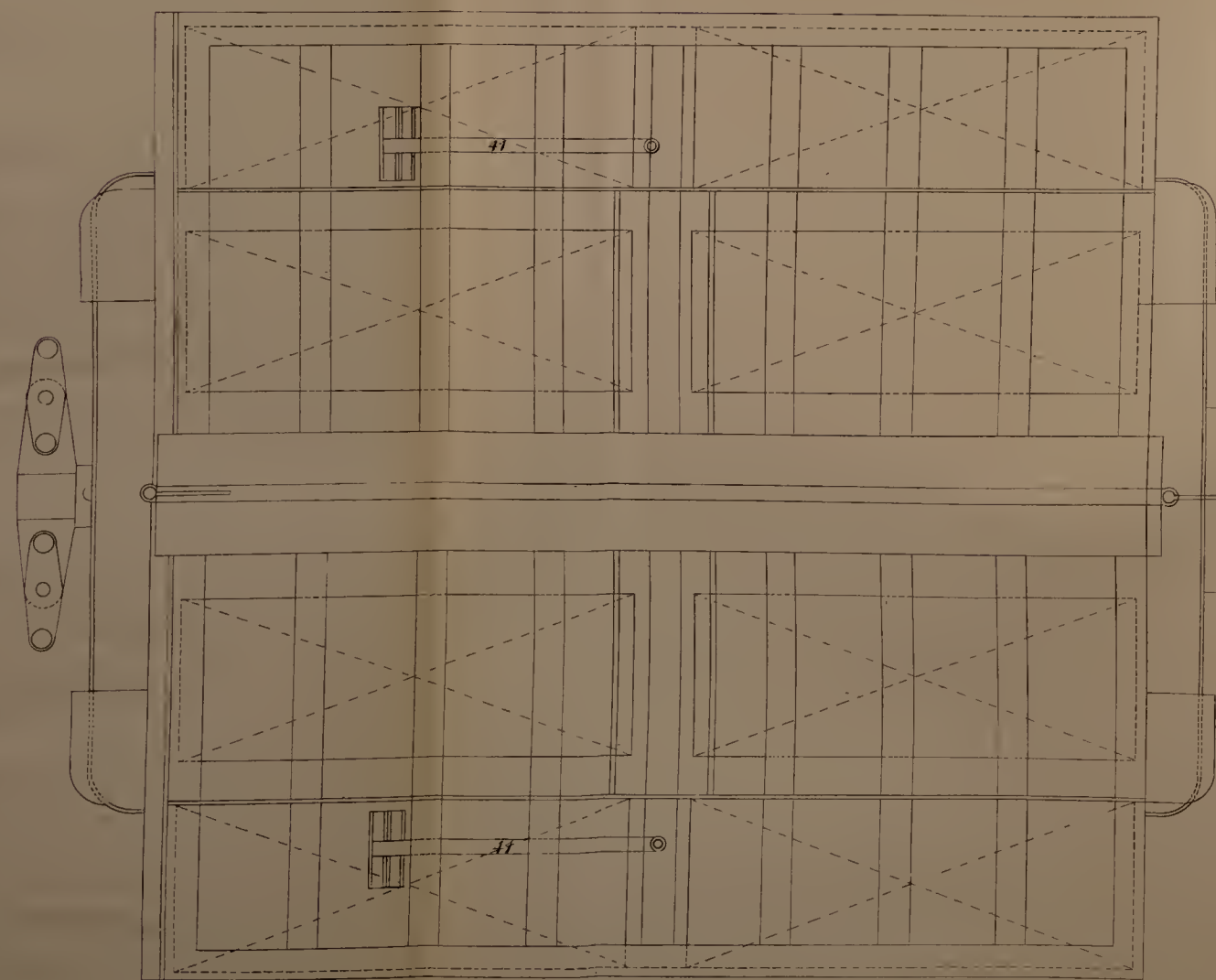


FIG. 4.

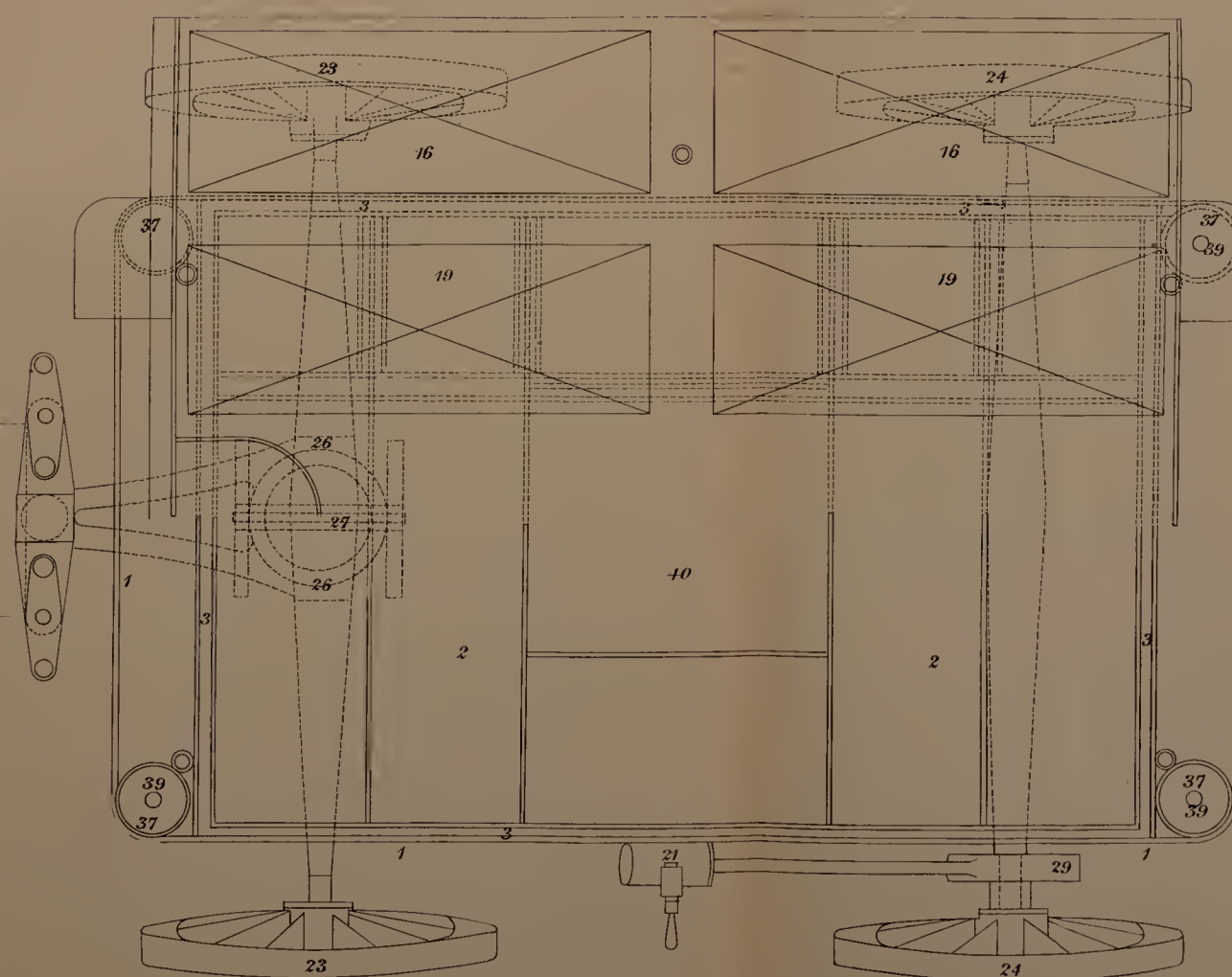


FIG. 3.

Half sectional plan on line C. D.

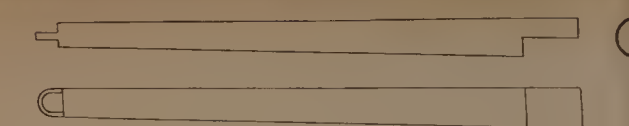


FIG. 8.

Shaft

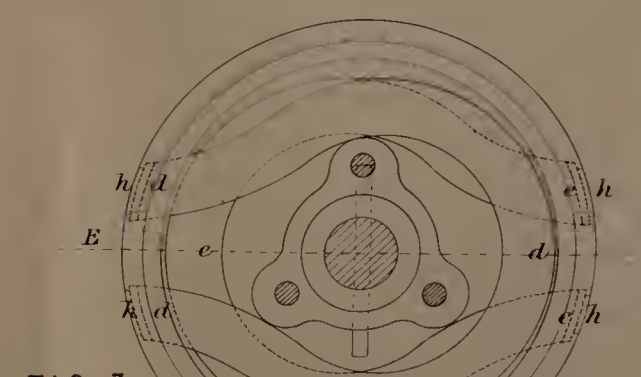


FIG. 7.

Scale 3 ins = 1 Foot

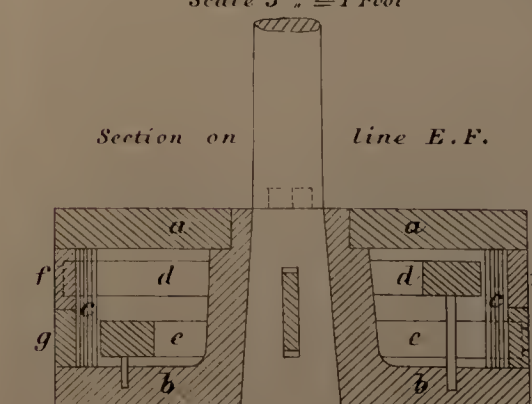


FIG. 6.

Magnetic Metallic Piston.

